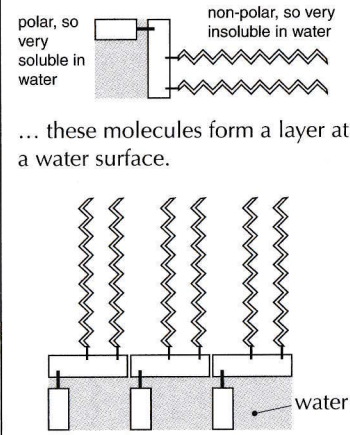


Fibrous protein is **glycosylated** and important in cell identification e.g. **glycophorin** in the membrane of erythrocytes determines blood groups.

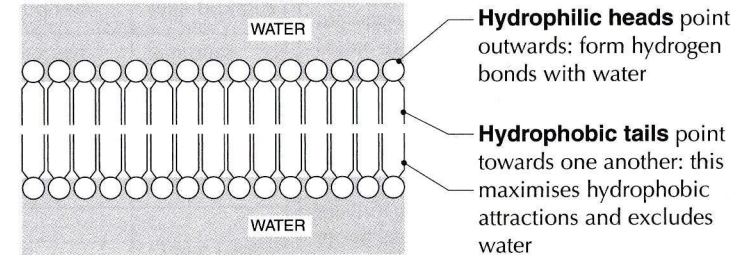
Glycocalyx composed of **oligosaccharides** is important in recognition – cell-cell contacts of this type may regulate cell growth, division and development. The glycocalyx is added to membrane components synthesised in the endoplasmic reticulum at the Golgi complex before incorporation into the membrane.

Phospholipid bilayer is impermeable to water-soluble, charged solutes and is a barrier between adjacent aqueous environments.

Because of the different solubility properties of the two ends of **phospholipid** molecules ...



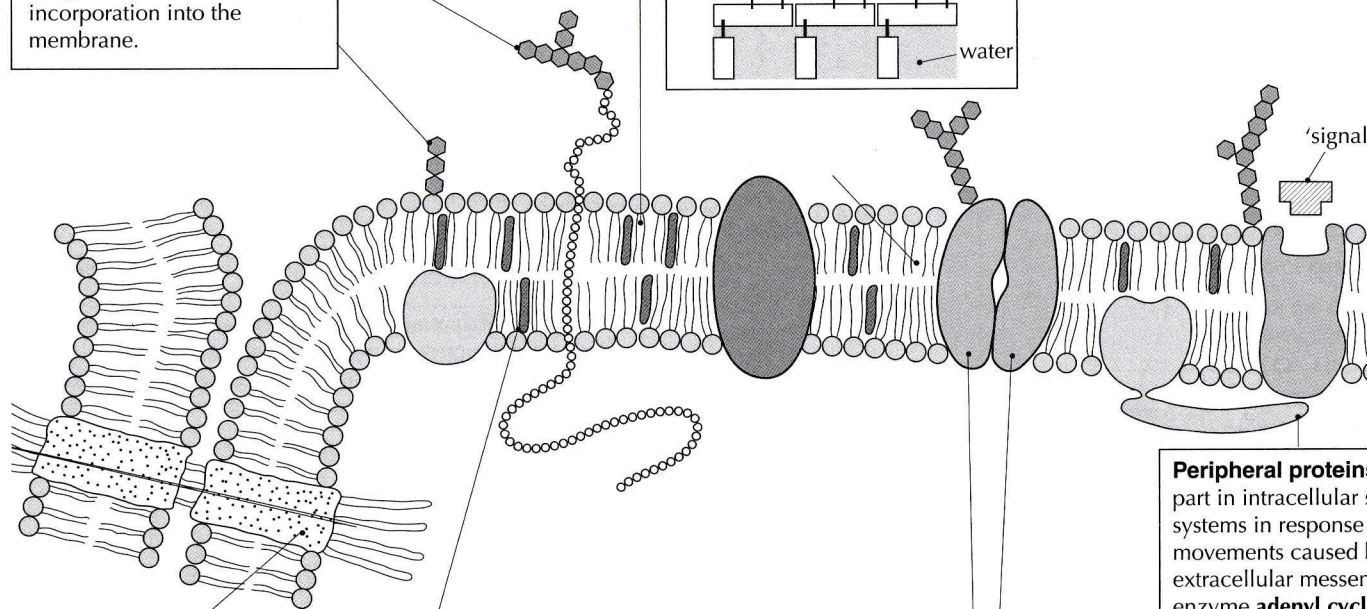
and a **phospholipid bilayer** can act as a barrier between two aqueous (watery) environments.



Receptor proteins have a specific shape which allows them to bind to other molecules with a complementary shape. The binding can set off a reaction in the cell, for example:

- the hormone adrenaline can bind to the correct receptor and set off reactions leading to the release of glucose inside the cell
- the neurotransmitter acetylcholine can bind to the postsynaptic membrane and cause an inflow of sodium ions as an impulse is conducted
- growth substances may bind and control nuclear division in cells within a tissue.

These messengers are part of a **signalling** system which makes sure that cells perform their functions to the correct extent and at the right time.



Cell adhesion proteins firmly attach adjacent cells to one another, this is particularly important in epithelia. These proteins also serve as internal anchorage points for protein tubules of the cytoskeleton.

Cholesterol acts as a fluidity buffer – at low temperatures it prevents crystallisation of hydrocarbon tails and at high temperatures it prevents excessive fatty acid mobility which might otherwise affect membrane permeability.

Pore proteins provide channels for polar molecules:

- between the cell and its aqueous environment;
- between the cytoplasm of adjacent cells.

Peripheral proteins may play a part in intracellular signalling systems in response to protein movements caused by binding to extracellular messengers. The enzyme **adenyl cyclase** is closely associated with the membrane's inner surface and catalyses the conversion.

ATP \longrightarrow cyclic AMP

as a **second messenger** following the binding of some hormones, e.g. adrenaline.

Molecules in the plasmamembrane

Allow:

- recognition;
- signalling;
- adhesion;
- fluidity.